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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT:	Robert Jonathon Carr et al.
SERIAL NO.:	10/762,711
FILED:	January 22, 2004
FOR:	LIFT SYSTEM FOR AN AERIAL CRANE AND PROPULSION SYSTEM FOR A VEHICLE
DOCKET NO.:	007451.00002
ART UNIT:	3644
EXAMINING ATTORNEY:	Barefoot, Galen L.

AFFIDAVIT UNDER 37 CFR § 1.132

I, Michael Higgins, being duly sworn, do hereby declare under penalty and perjury that I am over the age of 18 and a resident of Oklahoma City, Oklahoma. I have actively been involved in the design of aircraft for twenty-four years. I am a co-inventor on U.S. Patent Application No. 10/762,711 entitled "Lift System for An Aerial Crane" (hereinafter referred to as the '711 patent application). During my career as an aircraft designer I have become very familiar with the needs in the industry along with many of the shortcomings of designs that are currently available.

I recently had the opportunity to review French Patent No. 83,262 entitled "Engin De Transport Aerien" issued to Michel Claude Louis Pelet along with translations of various portions of the Pelet patent. The device of Pelet differs in at least two key ways from the invention disclosed and claimed in the '711 patent application. First, in Pelet the airflow exits the lift ducts directly downward from the vehicle. Second, the lift in the device in Pelet is

generated through use of direct force downward. The only exception to that is the device shown in Figure 17 which has a relatively small component of thrust used to propel the aircraft horizontally. This horizontal thrust blows across the top of the wing thus creating lift due to Bernoulli's principle. This is a relatively small amount of lift when compared to the amount of lift generated by the direct thrust downward. It is important to note this lift generated using Bernoulli's principle is generated on airflow flowing across the top surface of the wing and not flowing across the curved surface as found in the pending '711 patent application.

In looking at the embodiment shown in Figures 1 through 10 it is apparent that the lift duct 21 is not capable of producing any lift based upon Bernoulli's principle. Bernoulli's principle basically states as the velocity of a fluid flowing across a surface increases the pressure on that surface decreases. As best seen in Figure 3 of Pelet, the exhaust 16 from the turbine enters the lift ducts at an angle almost perpendicular to the entry way of the lift duct. As it enters the lift duct 21, it flows across and strikes the bottom side of the wing 19. This generates the downward airflow indicated by the arrows. This downward airflow creates direct thrust thus providing lift. As this exhaust 16 from the turbine flows through the lift duct it also entrains air from above the lift duct as indicated by arrows 24. The majority of this entrained air is blown along the bottom surface of the wing 19 along with the exhaust from the turbine. This greatly increases the velocity of the gases blown along the bottom surface of wing 19 which in turn drops the air pressure on the bottom surface of the wing 19 which in turn would create a downward force.

Of the air flowing through the lift duct the vast majority of it would be flowing across the bottom surface of the wing 19. This is due to the direction of the exhaust from the turbine. This leaves only a small percentage of the total volume and mass of air flowing through the lift duct to

flow across the top surface of the structure 22 which is in some ways analogous to the curved surface of the invention in the '711 patent application. Because only a small percentage of the total volume and mass of air flowing through the lift duct flows across the surface 22, the net result of any forces generated due to Bernoulli's principle from the air flow through the duct would be in the downward direction or a negative lift. This in turn will cancel out some of the lift force generated by the direct thrust of the same air flow exiting directly downward.

I have come to these conclusions based upon the language in the patent and the drawings. In particular on page 2, column 2, in the third paragraph from the end, the patent describes the turbine as having an outward flow. In looking at the figures provided which show the flow of the air, in particular Figures 3, 11, 15, 16, 17, 19, 20 and 22 all of which show the air flow going directly downward to generate thrust.

The lift system for an aerial crane as described and claimed in the '711 patent application provides an answer to a long felt need within the aeronautical, automotive, watercraft and hovercraft industries. One of the primary and driving forces within these industries is to provide vehicles and craft which can operate efficiently. This means they must be able to generate a maximum amount of energy or force from the fuel consumed. One of the key components in pursuing efficiency is to be able to efficiently apply the power of generated. One of the measures of this efficiency is the amount of lift or force generated per horsepower used.

By way of example a typical helicopter produces approximately 5 to 12 pounds of lift or force for every horsepower of its engine. That same horsepower when applied using the invention disclosed and claimed in the '711 patent application provides a lift or force of approximately 29 pounds of lift per horsepower. These results are based on calculations as well as prototype modeling. As can be seen by comparison of these numbers, the device disclosed

and claimed in the '711 patent application provides a solution to this long felt need in these industries. Recently this need has become even more urgent as the price of petroleum based fuels have hit record highs.

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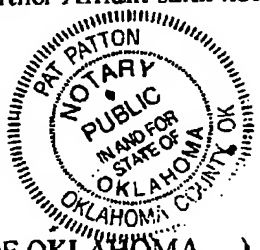

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STATE OF OKLAHOMA)
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COUNTY OF Okl)

Before me this 23 day of June, 2006, personally appeared the above named individual, to me known to be the person who is described in, and who executed the foregoing document.

Pat Patton
Notary Public

My commission number is 8387
My commission expires 5-16-08